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EXAMINER	
MANNING, JOHN	
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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/654,317	NICHOLS, JAMES	
	Examiner	Art Unit	
	John Manning	2614	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-29 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-29 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1, 2, 8 and 12 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 8, 12 and 29 are rejected under 35 U.S.C. 102(e) as being anticipated by Lakshman et al. (US Pat No 6,269,078).

In regard to claim 1, the Lakshman et al. reference discloses a method and apparatus for allocating bandwidth based on the properties of a video source. The claimed step of "identifying a previously-generated histogram of bitrate as a function of time associated with a multimedia program to be transmitted to a multimedia node" is met by Figure 6a. "A histogram and auto-correlation of the B frames of the data is shown in FIGS. 6A and 6B. B frames are shown because they are the most frequently occurring frames in the studied sequence" (Col 9, Lines 46-50). "Having considered the active and inactive sources and their characteristics, it is possible to thus model and predict what the cell rate needs will be for an encoder based on the types of video to be

transmitted" (Col 10, Lines 13-16). The histogram of Figure 6A is inherently a function of time because with the knowledge of the frames per second of the system (commonly 30 frames per second) the temporal characteristic can be calculated. "The average rate for these frames is then calculated. This average rate can then be used as the demand requested of the network. Specifically, it would be appropriate then to predict the requirements of N frames in advance (as a moving window), and compute a demand (placed at time t) based on the average rate for these N frames. In one example, it might be appropriate to select a window as large as five frames" (Col 11, Lines 5-12). Consequently, the bitrate is generated previous to transmission of the current frame. "Alternatively, there are active sources such as sports telecasts and movies. In these sources, the image changes frequently and the amount of change in an image can be dramatic" (Col 7, Lines 28-31). The movie as an active source meets the limitation of a multimedia program. The claimed step of "changing a bandwidth allocation for the multimedia node in anticipation of a further bitrate spike indicated in the bitrate histogram" is met by Figure 2 and Figure 6a. "The demand for the video source must be predicted sufficiently ahead of time so that feedback from the network arrives in time for providing the rate information to the video encoder to encode the next frame. That is, it is important that the prediction as to a particular part of the video be done far enough in advance so that the network processes the demand and sends back an allocated rate with the appropriate timing to execute that rate on the video which formed the basis for the prediction for the demand. Furthermore, the rate returned (ER) needs to be adequate to transmit the subsequent video frame(s) (until the next feedback is

received) without significant degradation in quality or unacceptable delay" (Col 10, Lines 18-26).

In regard to claim 8, the claimed step of "receiving a request for a previously-encoded multimedia program from the first multimedia node" is inherent to the reference. The claimed step of "allocating a first amount of bandwidth to supply said multimedia program to said multimedia node" is met by Figure 2 and Figure 6a. A "desirable cell rate, to the network. The network, in the form of the switches and links which transport the video data, allocates bandwidth (cell rate) to the video sources connected to the network in accordance with one of a selected number of different methods which are referred to below" (Col 4, Lines 54-60). The claimed step of "dynamically adjusting said first amount of bandwidth based on a previously-generated template of bitrate data as a function of time indicating changes in bitrate requirements of said multimedia program, wherein said adjusting is done prior to the occurrence of said changes" is also met by Figure 2 and Figure 6a. "The demand for the video source must be predicted sufficiently ahead of time so that feedback from the network arrives in time for providing the rate information to the video encoder to encode the next frame. That is, it is important that the prediction as to a particular part of the video be done far enough in advance so that the network processes the demand and sends back an allocated rate with the appropriate timing to execute that rate on the video which formed the basis for the prediction for the demand. Furthermore, the rate returned (ER) needs to be adequate to transmit the subsequent video frame(s) (until the next feedback is received) without significant degradation in quality or unacceptable delay" (Col 10, Lines

18-26). "The average rate for these frames is then calculated. This average rate can then be used as the demand requested of the network. Specifically, it would be appropriate then to predict the requirements of N frames in advance (as a moving window), and compute a demand (placed at time t) based on the average rate for these N frames. In one example, it might be appropriate to select a window as large as five frames" (Col 11, Lines 5-12). Consequently, the bitrate is generated previous to transmission of the current frame.

In regard to claim 12, the claimed step of "dynamically adjusting said first amount of bandwidth based on a template of bitrate data as a function of time indicating changes in bitrate requirements of a multimedia program" is met by Figure 2 and Figure 6a. "The demand for the video source must be predicted sufficiently ahead of time so that feedback from the network arrives in time for providing the rate information to the video encoder to encode the next frame. That is, it is important that the prediction as to a particular part of the video be done far enough in advance so that the network processes the demand and sends back an allocated rate with the appropriate timing to execute that rate on the video which formed the basis for the prediction for the demand. Furthermore, the rate returned (ER) needs to be adequate to transmit the subsequent video frame(s) (until the next feedback is received) without significant degradation in quality or unacceptable delay" (Col 10, Lines 18-26).

In regard to claim 29, the claimed step of "receiving a request for a multimedia program from the first multimedia node" is inherent to the reference. The claimed step of "identifying a first bitrate histogram associated with a first multimedia program" is met

by Figure 6a. "A histogram and auto-correlation of the B frames of the data is shown in FIGS. 6A and 6B. B frames are shown because they are the most frequently occurring frames in the studied sequence" (Col 9, Lines 46-50). "Having considered the active and inactive sources and their characteristics, it is possible to thus model and predict what the cell rate needs will be for an encoder based on the types of video to be transmitted" (Col 10, Lines 13-16). The claimed step of "allocating a particular amount of bandwidth to supply the first multimedia program to said multimedia node" is met by Figure 2 and Figure 6a. A "desirable cell rate, to the network. The network, in the form of the switches and links which transport the video data, allocates bandwidth (cell rate) to the video sources connected to the network in accordance with one of a selected number of different methods which are referred to below" (Col 4, Lines 54-60). The reference discloses the allocation of a first amount of bandwidth to supply multimedia content to a multimedia node where the bandwidth allocation is adjusted dynamically. The bandwidth allocated is maintained until another multimedia node requires bandwidth. "In step 501 the video source predicts the bandwidth or encoding rate which will be necessary for a near future collection of video data. Having generated such a prediction, the source generates a bandwidth request and transmits it to the network in step 502. The network then processes this request to determine an explicit rate at which the video source should transmit in step 503 and sends that explicit rate back to the video source in step 504. The encoder at the video source is then adjusted to reflect the rate allocated to the video source by the network in step 505. The process is then repeated" (Col 5, Lines 12-22). "The average rate for these frames is then

calculated. This average rate can then be used as the demand requested of the network. Specifically, it would be appropriate then to predict the requirements of N frames in advance (as a moving window), and compute a demand (placed at time t) based on the average rate for these N frames. In one example, it might be appropriate to select a window as large as five frames" (Col 11, Lines 5-12). Consequently, the bitrate is generated previous to transmission of the current frame. "Alternatively, there are active sources such as sports telecasts and movies. In these sources, the image changes frequently and the amount of change in an image can be dramatic" (Col 7, Lines 28-31). The movie as an active source meets the limitation of a multimedia program.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 2-7, 9-11, 13-17, and 27-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lakshman et al. in view of Ito et al (US Pat No 6,014,693).

In regard to claim 2, Lakshman discloses a bandwidth allocation system that dynamically alters the bandwidth based on prediction using statistical data (i.e. the histogram) of the video source. The reference fails to explicitly disclose that histograms are stored in a database. The Ito reference teaches the use of a database to store information regarding video data to facilitate the organization of the information. With

respect to the Ito reference, when the user inputs a request to view multimedia, the system refers to the video data index 13, to determine the proper bit rate. The "video index information defines a plurality of settings for the transfer bit rate of video data and indicates which data included in the original video data the video server should transfer to the client when setting the transfer bit rate to one of the plurality of settings. Furthermore, the video data assembler extracts data from the original video data by referring to the video data index information so as to set the transfer bit rate to one of the plurality of settings" (Col 3, Lines 12-20). It is inherent that the server uses identification data to identify the proper "template". Consequently, it would have been obvious to one of ordinary skill in the art to implement the Lakshman reference with the use of a database to store information regarding video data to facilitate the organization of the information.

In regard to claims 3-4, the combined teaching discloses a system for delivering video data with a dynamic bandwidth allocation based on prediction using statistical data (i.e. the histogram) of the video source and buffering so as to ensure the continuity of the data received by the "multimedia node" or client. The combined teaching fails to explicitly disclose the use of serial numbers or checksums for identification of multimedia content as claimed. However, the examiner gives OFFICIAL NOTICE that it is notoriously well known in the art to use serial numbers or checksums for identification so as to allow multimedia content to be identified. Consequently, it would have been clearly obvious to one of ordinary skill in the art to implement the combined teaching

with serial numbers identification of multimedia content for so as to allow multimedia content to be identified.

In regard to claim 5, the video data index 13 is located on a server remote from the client equipment (Figures 2, 5, and 7-8).

In regard to claim 6, Lakshman discloses a bandwidth allocation system that dynamically alters the bandwidth based on prediction of future bitrate spikes using statistical data (i.e. the histogram) of the video source. The reference fails to explicitly disclose filling an input buffer by a particular amount. The Ito reference teaches the filling of an input buffer by a particular amount so as to prevent services provided by the video server from being interrupted. The Ito system comprises an input buffer at the "node" so as to account for changes in the transfer bit rate such as a "spike". "Reference numeral 117 denotes a network load sensor for detecting a load imposed on a network 103, and 121 denotes a precharge buffer, which is a component of the client 102, for absorbing changes in the transfer bit rate of video data delivered by the video server 101 so as to prevent video data transferring services provided by the video server 101 from being interrupted." (Col 9, Lines 36-43). Consequently, it would have been obvious to one of ordinary skill in the art to implement the Lakshman reference with the filling of an input buffer by a particular amount so as to prevent services provided by the video server from being interrupted.

In regard to claim 7, with regard to the Ito reference, when "the transfer bit rate is changed, in step F47, the video data assembler 14, in step F49, extracts data to be transferred at a transfer bit rate which is increased from the current transfer bit rate by

one level in accordance with the video data index so as to increase the current bit rate and reassembles the extracted data to create video data. Then, the video data delivery unit 15 delivers the video data" (Col 7, Lines 5-11). And the buffer 121 absorbs the change "in the transfer bit rate of video data delivered by the video server 101 so as to prevent video data transferring services provided by the video server 101 from being interrupted." (Col 9, Lines 39-43).

In regard to claim 9 and 10, Lakshman discloses a bandwidth allocation system that dynamically alters the bandwidth based on prediction using statistical data (i.e. the histogram) of the video source. The reference fails to explicitly disclose that histograms are stored in a database. The Ito reference teaches the use of a database to store information regarding video data to facilitate the organization of the information. With respect to the Ito reference, when the user inputs a request to view multimedia, the system refers to the video data index 13, to determine the proper bit rate. The "video index information defines a plurality of settings for the transfer bit rate of video data and indicates which data included in the original video data the video server should transfer to the client when setting the transfer bit rate to one of the plurality of settings. Furthermore, the video data assembler extracts data from the original video data by referring to the video data index information so as to set the transfer bit rate to one of the plurality of settings" (Col 3, Lines 12-20). It is inherent that the server uses identification data to identify the proper "template". Consequently, it would have been obvious to one of ordinary skill in the art to implement the Lakshman reference with the use of a database to store information regarding video data to facilitate the organization

of the information. It is inherent that the server uses identification data to identify the proper "template".

In regard to claims 11, the combined teaching discloses a system for delivering video data with a dynamic bandwidth allocation based on prediction using statistical data (i.e. the histogram) of the video source and buffering so as to ensure the continuity of the data received by the "multimedia node" or client. The combined teaching fails to explicitly disclose the use of serial numbers or checksums for identification of multimedia content as claimed. However, the examiner gives OFFICIAL NOTICE that it is notoriously well known in the art to use serial numbers or checksums for identification so as to allow multimedia content to be identified. Consequently, it would have been clearly obvious to one of ordinary skill in the art to implement the combined teaching with serial numbers identification of multimedia content for so as to allow multimedia content to be identified.

In regard to claim 13 the combined teaching discloses a system for delivering video data with a dynamic bandwidth allocation based on prediction using statistical data (i.e. the histogram) of the video source and buffering so as to ensure the continuity of the data received by the "multimedia node" or client. The combined teaching fails to explicitly disclose the use of a digital video disk as the multimedia content as claimed. However, the examiner gives OFFICIAL NOTICE that it is notoriously well known in the art to use digital video disk as the multimedia content so as to provide a storage medium for the multimedia data. Consequently, it would have been clearly obvious to one of ordinary skill in the art to implement the combined teaching with the use of a

digital video disk as the multimedia content so as to provide a storage medium for the multimedia data.

In regard to claim 14, Lakshman discloses a bandwidth allocation system that dynamically alters the bandwidth based on prediction of future bitrate spikes using statistical data (i.e. the histogram) of the video source. The reference fails to explicitly disclose filling an input buffer by a particular amount. The Ito reference teaches the filling of an input buffer by a particular amount so as to prevent services provided by the video server from being interrupted. The Ito system comprises an input buffer at the "node" so as to account for changes in the transfer bit rate such as a "spike". "Reference numeral 117 denotes a network load sensor for detecting a load imposed on a network 103, and 121 denotes a precharge buffer, which is a component of the client 102, for absorbing changes in the transfer bit rate of video data delivered by the video server 101 so as to prevent video data transferring services provided by the video server 101 from being interrupted." (Col 9, Lines 36-43). Consequently, it would have been obvious to one of ordinary skill in the art to implement the Lakshman reference with the filling of an input buffer by a particular amount so as to prevent services provided by the video server from being interrupted.

In regard to claim 15, Lakshman discloses a bandwidth allocation system that dynamically alters the bandwidth based on prediction of future bitrate spikes using statistical data (i.e. the histogram) of the video source. The reference fails to explicitly disclose filling an input buffer by a particular amount in anticipation of an increase in bitrate requirements for multimedia content to a second node. The Ito reference teaches

the filling an input buffer by a particular amount in anticipation of an increase in bitrate requirements for multimedia content to a second node so as to prevent services provided by the video server from being interrupted. The Ito system comprises an input buffer at the "node" so as to account for changes in the transfer bit rate such as a "spike". "In FIG. 5, the client 2 outputs a request for transfer of video data to the video server 1. When the video server receives the transfer request from the client, the video server delivers a constant amount of data within a certain time in accordance with the transfer bit rate of video data so as to transfer the video data requested by the client through the video data delivering unit 15, in steps F61 and F62. The video server, in step F63, starts to measure a load L_n imposed on the network at constant intervals T_1 by means of the network load sensor 17 just after transfers of video data are started. Then, the video server compares a measured value L_n of the network load to a reference value L_1, which is the maximum of the network load that cannot be exceeded in order to maintain the current transfer bit rate" (Col 7, Lines 44-57). The bit rate is adjusted in response to the load on the network. Therefor, the bit rate is adjusted when another client or node request video data. Also, there is an input buffer at the "node" so as to account for changes in the transfer bit rate such as a "spike". "Reference numeral 117 denotes a network load sensor for detecting a load imposed on a network 103, and 121 denotes a precharge buffer, which is a component of the client 102, for absorbing changes in the transfer bit rate of video data delivered by the video server 101 so as to prevent video data transferring services provided by the video server 101 from being interrupted." (Col 9, Lines 36-43). Consequently, it would have been obvious to one of

ordinary skill in the art to implement the Lakshman reference with the filling an input buffer by a particular amount in anticipation of an increase in bitrate requirements for multimedia content to a second node so as to prevent services provided by the video server from being interrupted.

In regard to claim 16, Lakshman discloses a bandwidth allocation system that dynamically alters the bandwidth based on prediction of future bitrate spikes using statistical data (i.e. the histogram) of the video source. The reference fails to explicitly disclose filling an input buffer by a particular amount. The Ito reference teaches the filling of an input buffer by a particular amount so as to prevent services provided by the video server from being interrupted. The Ito system comprises an input buffer at the "node" so as to account for changes in the transfer bit rate such as a "spike". "Reference numeral 117 denotes a network load sensor for detecting a load imposed on a network 103, and 121 denotes a precharge buffer, which is a component of the client 102, for absorbing changes in the transfer bit rate of video data delivered by the video server 101 so as to prevent video data transferring services provided by the video server 101 from being interrupted." (Col 9, Lines 36-43).

In regard to claim 17, the Ito reference discloses the filling an input buffer by a particular amount in anticipation of an increase in bitrate requirements for multimedia content to a second node so as to prevent services provided by the video server from being interrupted. The Ito system comprises an input buffer at the "node" so as to account for changes in the transfer bit rate such as a "spike". "In FIG. 5, the client 2 outputs a request for transfer of video data to the video server 1. When the video

server receives the transfer request from the client, the video server delivers a constant amount of data within a certain time in accordance with the transfer bit rate of video data so as to transfer the video data requested by the client through the video data delivering unit 15, in steps F61 and F62. The video server, in step F63, starts to measure a load L_n imposed on the network at constant intervals T_1 by means of the network load sensor 17 just after transfers of video data are started. Then, the video server compares a measured value L_n of the network load to a reference value L_1, which is the maximum of the network load that cannot be exceeded in order to maintain the current transfer bit rate" (Col 7, Lines 44-57). The bit rate is adjusted in response to the load on the network. Therefor, the bit rate is adjusted when another client or node request video data. Also, there is an input buffer at the "node" so as to account for changes in the transfer bit rate such as a "spike". "Reference numeral 117 denotes a network load sensor for detecting a load imposed on a network 103, and 121 denotes a precharge buffer, which is a component of the client 102, for absorbing changes in the transfer bit rate of video data delivered by the video server 101 so as to prevent video data transferring services provided by the video server 101 from being interrupted." (Col 9, Lines 36-43).

In regard to claim 27, Lakshman discloses a bandwidth allocation system that dynamically alters the bandwidth based on prediction using statistical data (i.e. the histogram) of the video source. The claimed step of "identifying a bitrate histogram associated with multimedia content to be transmitted to a multimedia node" is met by Figure 6a. "A histogram and auto-correlation of the B frames of the data is shown in

FIGS. 6A and 6B. B frames are shown because they are the most frequently occurring frames in the studied sequence" (Col 9, Lines 46-50). "Having considered the active and inactive sources and their characteristics, it is possible to thus model and predict what the cell rate needs will be for an encoder based on the types of video to be transmitted" (Col 10, Lines 13-16). The reference fails to explicitly disclose delaying a start time in anticipation of a future bitrate spike. The Ito reference teaches the filling of an input buffer by a particular amount or delaying a start time in anticipation of a future bitrate spike so as to prevent services provided by the video server from being interrupted. The Ito system comprises an input buffer at the "node" so as to account for changes in the transfer bit rate such as a "spike". "Reference numeral 117 denotes a network load sensor for detecting a load imposed on a network 103, and 121 denotes a precharge buffer, which is a component of the client 102, for absorbing changes in the transfer bit rate of video data delivered by the video server 101 so as to prevent video data transferring services provided by the video server 101 from being interrupted." (Col 9, Lines 36-43). Consequently, it would have been obvious to one of ordinary skill in the art to implement the Lakshman reference with delaying a start time in anticipation of a future bitrate spike so as to prevent services provided by the video server from being interrupted.

In regard to claim 28, the Ito reference discloses the filling of an input buffer by a particular amount so as to prevent services provided by the video server from being interrupted. The Ito system comprises an input buffer at the "node" so as to account for changes in the transfer bit rate such as a "spike". "Reference numeral 117 denotes a

network load sensor for detecting a load imposed on a network 103, and 121 denotes a precharge buffer, which is a component of the client 102, for absorbing changes in the transfer bit rate of video data delivered by the video server 101 so as to prevent video data transferring services provided by the video server 101 from being interrupted." (Col 9, Lines 36-43).

6. Claims 18, 21-22, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lakshman et al. in view of Humpleman (US Pat No 6,188,397).

In regard to claim 18, the Lakshman reference discloses the allocation of a first amount of bandwidth to supply multimedia content to a multimedia node where the bandwidth allocation is adjusted dynamically. A "desirable cell rate, to the network. The network, in the form of the switches and links which transport the video data, allocates bandwidth (cell rate) to the video sources connected to the network in accordance with one of a selected number of different methods which are referred to below" (Col 4, Lines 54-60). The claimed limitation that "the first amount of bandwidth is adjusted prior to the occurrence of said changes" is met by Figure 2 and Figure 6a. "The demand for the video source must be predicted sufficiently ahead of time so that feedback from the network arrives in time for providing the rate information to the video encoder to encode the next frame. That is, it is important that the prediction as to a particular part of the video be done far enough in advance so that the network processes the demand and sends back an allocated rate with the appropriate timing to execute that rate on the video which formed the basis for the prediction for the demand. Furthermore, the rate returned (ER) needs to be adequate to transmit the subsequent video frame(s) (until the

next feedback is received) without significant degradation in quality or unacceptable delay" (Col 10, Lines 18-26). "The average rate for these frames is then calculated. This average rate can then be used as the demand requested of the network. Specifically, it would be appropriate then to predict the requirements of N frames in advance (as a moving window), and compute a demand (placed at time t) based on the average rate for these N frames. In one example, it might be appropriate to select a window as large as five frames" (Col 11, Lines 5-12). Consequently, the bitrate is generated previous to transmission of the current frame. "Alternatively, there are active sources such as sports telecasts and movies. In these sources, the image changes frequently and the amount of change in an image can be dramatic" (Col 7, Lines 28-31). The movie as an active source meets the limitation of a multimedia program. The reference fails to explicitly disclose the use of this system in a home network. The Humpleman et al. reference teaches the use of a home network for connecting different types of household appliances so as to provide convenient means of control with client-server architecture (Col 2, Lines 33-67; Col 3, Lines 1-25). Accordingly, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the Humpleman et al. reference to incorporate the system in a home network.

In regard to claim 21, the claimed limitation of dynamically adjusting "said first amount of bandwidth based on a histogram of bitrate data indicating changes in bitrate requirements of said multimedia content requested by a second multimedia node" is met by Figure 2 and Figure 6a. "The demand for the video source must be predicted sufficiently ahead of time so that feedback from the network arrives in time for providing

the rate information to the video encoder to encode the next frame. That is, it is important that the prediction as to a particular part of the video be done far enough in advance so that the network processes the demand and sends back an allocated rate with the appropriate timing to execute that rate on the video which formed the basis for the prediction for the demand. Furthermore, the rate returned (ER) needs to be adequate to transmit the subsequent video frame(s) (until the next feedback is received) without significant degradation in quality or unacceptable delay" (Col 10, Lines 18-26).

In regard to claim 22, the combined teaching discloses a system for delivering video data with a dynamic bandwidth allocation based on prediction using statistical data (i.e. the histogram) of the video source and buffering so as to ensure the continuity of the data received by the "multimedia node" or client. The combined teaching fails to explicitly disclose the use of a digital video disk as the multimedia content as claimed. However, the examiner gives OFFICIAL NOTICE that it is notoriously well known in the art to use digital video disk as the multimedia content so as to provide a storage medium for the multimedia data. Consequently, it would have been clearly obvious to one of ordinary skill in the art to implement the combined teaching with the use of a digital video disk as the multimedia content so as to provide a storage medium for the multimedia data.

In regard to claim 26, the Lakshman reference discloses the allocation of a first amount of bandwidth to supply multimedia content to a multimedia node where the bandwidth allocation is adjusted dynamically. The bandwidth allocated is maintained until another multimedia node requires bandwidth. "In step 501 the video source

predicts the bandwidth or encoding rate which will be necessary for a near future collection of video data. Having generated such a prediction, the source generates a bandwidth request and transmits it to the network in step 502. The network then processes this request to determine an explicit rate at which the video source should transmit in step 503 and sends that explicit rate back to the video source in step 504. The encoder at the video source is then adjusted to reflect the rate allocated to the video source by the network in step 505. The process is then repeated" (Col 5, Lines 12-22).

7. Claims 19-20 and 23-25 rejected under 35 U.S.C. 103(a) as being unpatentable over Lakshman et al. in view of Humpleman and further in view of Ito et al.

In regard to claim 19, the combined teaching a bandwidth allocation system that dynamically alters the bandwidth based on prediction using statistical data (i.e. the histogram) of the video source in a home media server. The reference fails to explicitly disclose that histograms are stored in a database. The Ito reference teaches the use of a database to store information regarding video data to facilitate the organization of the information. With respect to the Ito reference, when the user inputs a request to view multimedia, the system refers to the video data index 13, to determine the proper bit rate. The "video index information defines a plurality of settings for the transfer bit rate of video data and indicates which data included in the original video data the video server should transfer to the client when setting the transfer bit rate to one of the plurality of settings. Furthermore, the video data assembler extracts data from the original video data by referring to the video data index information so as to set the

transfer bit rate to one of the plurality of settings" (Col 3, Lines 12-20). It is inherent that the server uses identification data to identify the proper "template". Consequently, it would have been obvious to one of ordinary skill in the art to implement the Lakshman reference with the use of a database to store information regarding video data to facilitate the organization of the information.

In regard to claims 20, the combined teaching discloses a system for delivering video data with a dynamic bandwidth allocation based on prediction using statistical data (i.e. the histogram) of the video source and buffering so as to ensure the continuity of the data received by the "multimedia node" or client. The combined teaching fails to explicitly disclose the use of serial numbers or checksums for identification of multimedia content as claimed. However, the examiner gives OFFICIAL NOTICE that it is notoriously well known in the art to use serial numbers or checksums for identification so as to allow multimedia content to be identified. Consequently, it would have been clearly obvious to one of ordinary skill in the art to implement the combined teaching with serial numbers identification of multimedia content for so as to allow multimedia content to be identified.

In regard to claim 23 and 25, the combined teaching discloses a bandwidth allocation system that dynamically alters the bandwidth based on prediction of future bitrate spikes using statistical data (i.e. the histogram) of the video source in a home media server. The combined teaching fails to explicitly disclose filling an input buffer by a particular amount. The Ito reference teaches the filling of an input buffer by a particular amount so as to prevent services provided by the video server from being

interrupted. The Ito system comprises an input buffer at the "node" so as to account for changes in the transfer bit rate such as a "spike". "Reference numeral 117 denotes a network load sensor for detecting a load imposed on a network 103, and 121 denotes a precharge buffer, which is a component of the client 102, for absorbing changes in the transfer bit rate of video data delivered by the video server 101 so as to prevent video data transferring services provided by the video server 101 from being interrupted." (Col 9, Lines 36-43). Consequently, it would have been obvious to one of ordinary skill in the art to implement the combined teaching with the filling of an input buffer by a particular amount so as to prevent services provided by the video server from being interrupted.

In regard to claim 24, the combined teaching discloses a bandwidth allocation system that dynamically alters the bandwidth based on prediction of future bitrate spikes using statistical data (i.e. the histogram) of the video source in a home media server. The combined teaching fails to explicitly disclose filling an input buffer by a particular amount in anticipation of an increase in bitrate requirements for multimedia content to a second node. The Ito reference teaches the filling an input buffer by a particular amount in anticipation of an increase in bitrate requirements for multimedia content to a second node so as to prevent services provided by the video server from being interrupted. The Ito system comprises an input buffer at the "node" so as to account for changes in the transfer bit rate such as a "spike". "In FIG. 5, the client 2 outputs a request for transfer of video data to the video server 1. When the video server receives the transfer request from the client, the video server delivers a constant amount of data within a certain time in accordance with the transfer bit rate of video data so as to transfer the

video data requested by the client through the video data delivering unit 15, in steps F61 and F62. The video server, in step F63, starts to measure a load L_n imposed on the network at constant intervals T_1 by means of the network load sensor 17 just after transfers of video data are started. Then, the video server compares a measured value L_n of the network load to a reference value L_1, which is the maximum of the network load that cannot be exceeded in order to maintain the current transfer bit rate" (Col 7, Lines 44-57). The bit rate is adjusted in response to the load on the network. Therefor, the bit rate is adjusted when another client or node request video data. Also, there is an input buffer at the "node" so as to account for changes in the transfer bit rate such as a "spike". "Reference numeral 117 denotes a network load sensor for detecting a load imposed on a network 103, and 121 denotes a precharge buffer, which is a component of the client 102, for absorbing changes in the transfer bit rate of video data delivered by the video server 101 so as to prevent video data transferring services provided by the video server 101 from being interrupted." (Col 9, Lines 36-43). Consequently, it would have been obvious to one of ordinary skill in the art to implement the combined teaching with the filling an input buffer by a particular amount in anticipation of an increase in bitrate requirements for multimedia content to a second node so as to prevent services provided by the video server from being interrupted.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to John Manning whose telephone number is 703-305-0345. The examiner can normally be reached on M-F: 8:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John W Miller can be reached on 703-305-4795. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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JM
December 21, 2004

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